

Evidence of Validity of the Productive Organizational Energy Measure in Brazilian Samples

Larissa Maria David Gabardo-Martins¹ 

Abstract: Productive organizational energy is conceptualized as a shared experience, in which the members of an organization present positive affects, cognitive stimulation and proactive behavior in order to satisfy the organization's objectives in which they work. This work aimed to obtain evidence of validity of the Productive Organizational Energy Measure. A total of 464 Brazilian workers of both sexes participated in the study. Confirmatory factor analyzes showed that the Brazilian version kept the 14 items and factors of the original instrument (affective energy, cognitive energy and behavioral energy). Multigroup analysis demonstrated configural, metric and scalar invariance between groups divided in terms of gender and organizational sector (public and private). The scale showed positive correlations with work motivation, work self-efficacy, work autonomy, job satisfaction, work engagement and organizational commitment. It was concluded that the instrument had psychometric properties that recommend its use in future investigations.

Keywords: psychological assessment, positive psychology, psychometry, factor analysis

Evidências de Validade da Medida de Energia Organizacional Produtiva em Amostras Brasileiras

Resumo: A energia organizacional produtiva conceitua-se como uma experiência compartilhada, em que os membros de uma organização apresentam afetos positivos, estimulação cognitiva e comportamento proativo em busca de satisfazer com objetivos da organização em que atuam. O presente estudo teve por objetivo obter evidências de validade da Medida de Energia Organizacional Produtiva. Participaram do estudo 464 trabalhadores brasileiros, de ambos os sexos. As análises fatoriais confirmatórias evidenciaram que a versão brasileira manteve os 14 itens e os fatores do instrumento original (energia afetiva, energia cognitiva e energia comportamental). As análises multigrupos atestaram a invariância configural, métrica e escalar entre os grupos divididos em termos de gênero e setor organizacional (público e privado). A escala apresentou correlações positivas com motivação no trabalho, autoeficácia no trabalho, autonomia no trabalho, satisfação no trabalho, engajamento no trabalho e comprometimento organizacional. Concluiu-se que o instrumento apresentou propriedades psicométricas que recomendam seu uso em investigações futuras.

Palavras-chave: avaliação psicológica, psicologia positiva, psicometria, análise fatorial

Evidencia de Validez de la Medida de Energía Productiva Organizacional en Muestras Brasileñas

Resumén: La energía productiva organizacional se conceptualiza como una experiencia compartida, en la que los miembros de una organización presentan afectos positivos, estimulación cognitiva y comportamiento proactivo para satisfacer los objetivos de la organización en la que trabajan. El presente trabajo tuvo como objetivo obtener evidencia de validez de la Medida de Energía Productiva Organizacional. Participaron en el estudio un total de 464 trabajadores brasileños de ambos sexos. Los análisis factoriales confirmatorios mostraron que la versión brasileña mantuvo los 14 ítems y factores del instrumento original (energía afectiva, energía cognitiva y energía conductual). Multigrupos análisis han atestiguado la invarianza configural, métrica y escalar entre los grupos divididos por género y sector organizacional (público y privado). La escala mostró correlaciones positivas con motivación laboral, autoeficacia laboral, autonomía laboral, satisfacción laboral, engagement en el trabajo y compromiso organizacional. Se concluyó que el instrumento tiene propiedades psicométricas que recomiendan su uso en futuras investigaciones.

Palabras clave: evaluación psicológica, psicología positiva, psicometría, análisis factorial

¹Universidade Salgado de Oliveira, Niterói-RJ, Brazil

Correspondence address: Larissa Maria David Gabardo-Martins.
Universidade Salgado de Oliveira - Rua Marechal Deodoro, Niterói-RJ,
Brazil. CEP 24.030-060. E-mail: gabardo.larissa@gmail.com

For a long time, researchers and professionals in the field of psychology focused on everything that worked poorly in individuals, the negative aspects of life, such as mental disorders and pathologies (Seligman & Csikszentmihalyi, 2000).

In reaction to this condition, the Positive Psychology movement emerged in the United States in the late 1990s, in which it was proposed that psychology should change its focus from illness to health (Seligman & Csikszentmihalyi, 2000). With regard to the field of Organizational Psychology, under the influence of the Positive Psychology movement, organizational scholars began to adopt the positive perspective in their research (Luthans & Youssef-Morgan, 2021). Thus, several positive constructs gained prominence in this field of research. Among them can be mentioned: job satisfaction, organizational commitment, work engagement, and well-being at work. It is in the wake of such research that the construct productive organizational energy stood out.

It should be noted, however, that organizational energy has been investigated in the field of management literature since the 1980s (Louw, Sutherland, & Hofmeyr, 2012). But in the field of organizational psychology, under the influence of Positive Psychology, some scholars (Cole, Bruch, & Vogel, 2012; Quinn, 2007) have begun to investigate productive organizational energy, which can be defined as a shared experience in which members of an organization exhibit positive affect, cognitive stimulation, and proactive behavior in pursuit of satisfying the goals of the organization in which they operate. The construct is multidimensional, being composed of the dimensions: affective energy, cognitive energy, and behavioral energy (Cole et al., 2012).

Productive organizational energy is an important variable in the organizational context, as it is a resource that benefits both employees and organizations by increasing employee creativity, thinking efficiency, task concentration, and ultimately employee and organizational performance (Cole et al., 2012). Based on such statements, Cole et al. (2012) developed a measure to investigate the said construct, the Productive Energy Measure (PEM). The name of the scale has been translated to Productive Organizational Energy Measure (POEM) in this work. In researching the development and search for validity evidence of the aforementioned instrument, Cole et al. (2012), conducted four different studies, described as follows.

The first study had the participation of 2,208 North American workers, who responded to the initial version of the instrument composed of 17 items. Using exploratory and confirmatory factor analyses, three items were excluded. The results of these analyses showed a three-factor first-order structure (affective energy - 5 items, cognitive energy - 5 items, and behavioral energy - 4 items) and one second-order factor (productive energy; Cole et al., 2012). The internal consistency indices, calculated by Cronbach's alpha, were equal to 0.88 (second-order factor), 0.90 (affective energy), 0.77 (cognitive energy), and 0.61 (behavioral energy). The second study consisted of a sample of 660 North American workers and aimed to validate the same factor structure found in the first study, in an independent sample. The internal consistency indexes, also calculated by Cronbach's alpha, were 0.89 (second-order factor), 0.89 (affective energy), 0.74 (cognitive energy), and 0.73 (behavioral energy).

In the third, the PEM was applied to about 5000 workers from 145 departments, located in five different countries.

The results obtained by calculating the invariance of item parameters, convergent analysis (relation with the following variables: commitment to organizational goals, overall satisfaction with the organization), and discriminant validity provided additional evidence of construct validity of the PEM. Finally, in study 4, a positive relationship between productive energy and company performance was evidenced in a survey of 5939 employees from 92 companies.

In addition to the instrument development study, the scale had its validity evidence tested only in one more context, the South African context, in a sample composed of 304 workers. In the study to search for validity evidence, Cuff and Barkhuizen (2014) conducted Exploratory Factor Analysis to test the structure of the instrument in that context. The results showed that the three-factor structure (affective energy, cognitive energy, and behavioral energy) was appropriate for the data, with all 14 items retained.

Regarding the Brazilian context, the consultation to the national literature conducted in April 2021, in the databases at Scientific Electronic Library Online (SciELO) and *Portal de Periódicos Eletrônicos de Psicologia* (PePSIC), revealed that the instrument does not yet have validity evidence in Brazil. Thus, additional research is warranted to bring initial evidence of validities of the scores of the Productive Organizational Energy Measure in Brazilian samples.

These investigations may make available to Brazilian researchers an instrument for assessing productive organizational energy with possibilities of being adopted in the future in investigations focused on the organizational context, since, as previously cited, it plays an important role in increasing employee performance and, which may offer competitive advantage to organizations (Cole et al., 2012). Thus, this study aimed to obtain validity evidence for the Productive Organizational Energy Measure. More specifically, it sought to assess the internal structure, internal consistency, invariance of item parameters in terms of gender and organizational sector (public and private) of the POEM and test the relationship of productive occupational energy with other variables, namely: work motivation, work self-efficacy, work autonomy, job satisfaction, work engagement, and organizational commitment. Considering that the original instrument by Cole et al. (2012) was composed of three first order factors and a second order factor, the following hypothesis was formulated: The Brazilian version of the Productive Organizational Energy Measure will be composed of three first order factors and a second order factor (H1).

The invariance of an instrument is a fundamental technique in the development and use of psychometric instruments, since it allows conclusions about the invariance of the configuration and parameters of the instrument in different groups, which will ensure its future use in these groups (Fischer & Karl, 2019). Based on such statements, we hypothesized: POEM items are invariant across gender and organizational sector (H2).

With regard to the relationship of productive organizational energy with other variables, work motivation can be defined by the employee's orientation to perform his or her tasks with

agility and precision and to persist in their execution until the desired result is achieved (Gagné et al., 2010). According to Damarasri and Ahman (2020), employee motivation can drive productive organizational energy, because when employees feel motivated, they are more willing to participate in organizational activities, feeling energized to meet the goals of the company in which they work.

Work self-efficacy is conceptualized as individuals' perceived beliefs about their abilities to plan and execute tasks at work (Barros et al., 2012). Parray (2020) understands that self-efficacy at work can drive workers to achieve their own goals, as well as those of the organization, generating positive results. In this sense, self-efficacy acts as a stimulus for the worker to act with energy in completing their tasks.

Autonomy at work, in turn, is defined as the degree to which an individual receives freedom to perform his or her work activities and to make decisions (Breugh, 1999). Such a construct enables people to act according to their values, goals, and interests, which can lead to a greater perception of responsibility for work results. This implies that employees can better use their potential, which entails that they act energized in their work. However, when the individual does not have autonomy in his work, he has controlled behavior, which is experienced as a requirement to think or behave in a certain way, which can drain his energy in the work context (Sorlie, Bakker, Espevik, & Olsen, 2022).

Job satisfaction can be described as a pleasurable or positive emotional state that comes from evaluating work experiences (Gabardo-Martins, Ferreira, & Valentini., 2021). Work engagement can be characterized as a positive and fulfilling state related to work (Schaufeli, 2021). Finally, organizational commitment relates to the employee's attachment to the organization and is associated with the desire to stay in the job (Medeiros & Enders, 1998). According to Quinn (2007), when employees feel energized in their work, they enjoy positive interaction with each other. This entails the satisfaction of basic needs and, as a result, feelings of increased job satisfaction. In addition, energized connections between organizational members allow them to engage more fully with their tasks, which consequently improves organizational bonding. Based on these considerations, we hypothesized: There is a positive correlation between productive organizational energy and the constructs job motivation, job self-efficacy, job autonomy, job satisfaction, job engagement, and organizational commitment (H3).

Method

Participants

A total of 464 workers from 16 Brazilian states, plus the Federal District, participated in the survey, with the largest number of participants distributed among the states of São Paulo (31.9%) and Rio de Janeiro (13.8%). Most of the respondents were female (63.8%). As for the organizational sector, 69.0% were from the private sector and 31.0%

from the public sector. Regarding education, 42.2% had completed a lato or stricto sensu post-graduation and 30.2% had completed higher education. The professionals' age ranged from 19 to 69 years ($M = 38.11$; $SD = 11.35$), length of service from 1 to 27 years ($M = 6.08$; $SD = 6.13$), and total length of service from 1 to 51 years ($M = 15.40$; $SD = 11.16$). The only inclusion criterion for the study was that the person had been working for at least one year.

Instruments

Productive Organizational Energy Measure, by Cole et al. (2012). The instrument is composed of three factors (affective energy, cognitive energy, and behavioral energy) and 14 items in five-point Likert-type response format, ranging from one (never) to five (always) in the affective energy factor and from one (strongly disagree) to five (strongly agree) in the cognitive energy and behavioral energy factors. Example of an item of the affective energy factor: 'People in my work group get excited in their work'. Example of an item of the cognitive energy factor: 'My work group is ready to act at any moment'. Example item of the behavioral energy factor: 'The people in my work group strive to ensure the success of the organization at all times'. For the translation of the scale, the translation and back-translation procedure was adopted, which consists of a translation of the items into Portuguese, followed by the translation of this version back into English and the comparison of these two versions, in order to check for conceptual equivalence (Gregoire, 2018). Following some of the recommendations of this author, in a first step, the translation of the original instrument from English into Portuguese was performed by a researcher fluent in English. In the second stage, the Portuguese version was again translated into English, by an English-speaking teacher. Finally, in the next step, two researchers from the scale adaptation area conducted a technical review and the evaluation of the semantic equivalence of the two English versions.

Gagné et al. (2010) *Work Motivation Scale*. In the Brazilian version, the instrument is composed of 11 items, divided into two factors: autonomous motivation (six items) and control motivation (five items), and to be answered through a Likert scale of seven points, ranging from one (not at all) to seven (exactly). Example of an item of the autonomous motivation factor: 'Because I really like this job'. Example of an item of the controlled motivation factor: 'Because my work is my life and I don't want to fail'. In this research, the AFC results demonstrated good fit indices ($\chi^2 = 638.37(40)$, $RMSEA = 0.08$, $CFI = 0.97$ and $TLI = 0.96$) and confirmed the two-factor structure of the scale, with the retention of all items. The factors obtained internal consistency indices, calculated by Cronbach's alpha and McDonald's Omega, equal to 0.93 (α) and 0.94 (Ω), in the autonomous motivation factor, and 0.86 (α) and 0.91 (Ω) in the controlled motivation factor.

Self-efficacy at Work Scale, adapted by Barros et al. (2012). The instrument which is single-factor and composed of ten items, to be answered by means of a four-point Likert-type scale,

ranging from one (not at all true) to four (totally true). Example item: 'I can always solve difficult problems at work if I try hard enough'. In the current study, the AFC results showed good fit indices ($\chi^2 = 364.73(33)$, RMSEA = 0.07, CFI = 0.96 and TLI = 0.95), which confirmed the single-factor structure of the scale, with the retention of all items. The instrument obtained internal consistency indices, calculated by Cronbach's alpha and McDonald's Omega, equal to 0.90 (α) and 0.91 (Ω_t).

Breugh's *Autonomy at Work Scale* (1999). The measure is one-factor and consists of nine items, to be answered on a seven-point Likert scale, ranging from one (strongly disagree) to seven (strongly agree). Example item: 'I am allowed to decide how to do my work (what methods will be used)'. In the current investigation, the CFA results demonstrated good fit indices ($\chi^2 = 420.01(27)$, RMSEA = 0.08, CFI = 0.99 and TLI = 0.98) and confirmed the single-factor structure of the scale, with the retention of all items. The internal consistency indices, calculated by Cronbach's alpha by McDonald's Omega, equal to 0.95 (α) and 0.96 (Ω_t), in the current investigation.

General Job Satisfaction Scale, with validity evidence obtained by Gabardo-Martins et al. (2021). This instrument is unifactorial and composed of five items to be answered using a Likert-type scale of five points, ranging from one (strongly disagree) to five (strongly agree). Example of item: 'I am satisfied with my work'. In this study, the CFA results demonstrated good fit indices ($\chi^2 = 50.52(5)$, RMSEA = 0.06, CFI = 0.99 and TLI = 0.99), which confirmed the single-factor structure of the scale, with the retention of all items. The instrument obtained internal consistency indices, calculated by Cronbach's alpha and McDonald's Omega, equal to 0.94 (α) and 0.95 (Ω_t).

Work Engagement Scale, adapted by Ferreira et al. (2016). This measure is composed of nine items, to be answered on a seven-point Likert scale, ranging from 0 (never) to 6 (always). Example item: 'In my work, I feel full (full) of energy'. In this investigation, the CFA results demonstrated good fit indices ($\chi^2 = 243.76(26)$, RMSEA = 0.08, CFI = 0.99 and TLI = 0.99), corroborating the single-factor structure of the scale, with the retention of all items. The scale obtained internal consistency indices, calculated by Cronbach's alpha and McDonald's Omega, equal to 0.97 (α) and 0.96 (Ω_t).

Affective Organizational Commitment Scale adapted by Medeiros and Enders (1998). The scale consists of six items, to be answered on six-point scales, ranging from one (strongly disagree) to six (strongly agree). Example of an item: 'I feel that I really belong to my organization'. In this study, the CFA results showed good fit indices ($\chi^2 = 24.86(7)$, RMSEA = 0.06, CFI = 0.99 and TLI = 0.99), corroborating the single-factor structure of the scale, with the retention of all items. The measure obtained internal consistency indices, calculated by Cronbach's alpha and McDonald's Omega, equal to 0.93 (α) and 0.94 (Ω_t). The instruments were a survey of socio-demographic data.

Procedures

Data collection. To control the common bias of the method, the questionnaire was applied in two times

(Jordan & Troth, 2020), according to a procedure also used by Cole et al. (2012). At time one, the following variables were assessed: productive organizational energy, work motivation, work self-efficacy, and work autonomy, and the sociodemographic questionnaire. At time two, the variables: job satisfaction, job engagement, and organizational commitment were tested. To associate the answers in both times, the participants were asked to indicate their WhatsApp or e-mail, as preferred.

A form was created in the Google Forms application, with the instruments used. The individuals were invited to participate in the first part of the study through messages posted on Facebook and WhatsApp, in which the link to access the questionnaire was sent. To invite them to answer the second part of the survey, new messages were sent on WhatsApp or email, with the link to access the new questionnaire. The first part of the survey was answered by 650 participants. The second part was answered by 464 participants, totaling a sample loss of 28.6% between the first and second collection.

Data analysis. The information collected was tabulated in the statistical software SPSS version 21, followed by the analyses through the software, in the R software (R Core Team, 2017), in the Lavaan package. In assessing the reliability of each scale, the internal consistency indices were calculated using Cronbach's alpha coefficient and McDonald's Omega. Confirmatory factor analyses and multi-group confirmatory factor analyses were performed using the WLSMV (weighted least squares robustness) estimation method. Fit indices were evaluated according to the recommendations of Xia and Yang (2019): $\chi^2/DF < 5$; CFI > 0.95; TLI > 0.95; RMSEA < 0.08. The investigation of the relationships between the Productive Organizational Energy Measure and the other constructs related to it was performed by calculating correlations, using Structural Equation Modeling.

Ethical Considerations

The research was submitted to the Research Ethics Committee of the Universidade Salgado de Oliveira and approved by CAAE No. 46338121.4.0000.5289. The respondents agreed to participate in the research by filling out the Free and Informed Consent Form. In addition, the respondents were informed about the voluntary nature of the research, and about the anonymity of their answers.

Results

In the analysis of the instrument structure, based on the study by Cole et al. (2012), different models were tested: a one-factor model, three two-factor models (adding two factors in each one), a first-order three-factor model, and a first-order three-factor and a second-order three-factor model. The results showed that the first-order three-factor model presented the best fit rates compared to the other models tested (Table 1).

Table 1
Confirmatory factor analysis of the Productive Organizational Energy Measure

Models	χ^2 (DF)	CFI	TLI	RMSEA
Unifactorial	1335.27(77)	0.89	0.87	0.19 (0.18-0.20)
Two factors (behavioral and cognitive + affective)	1250.80(76)	0.90	0.88	0.18 (0.17-0.19)
Two factors (cognitive and behavioral + affective)	1049.05(76)	0.92	0.90	0.17 (0.16-0.18)
Two factors (affective and cognitive + behavioral)	711.11(76)	0.95	0.94	0.13 (0.12-0.14)
Three first-order factors	405.11(74)	0.97	0.96	0.08 (0.07-0.09)
Three first-order factors and a second-order factor	414.40 (74)	0.79	0.75	0.10 (0.09-0.11)

Note. χ^2 = chi-square; df = degrees of freedom; TLI = Tucker Lewis Index; CFI = Comparative Fix Index; RMSEA = Root Mean Square Error of Approximation.

The Brazilian version of the Productive Organizational Energy Measure was, therefore, composed of three factors (affective energy - five items, cognitive energy - five items and behavioral energy - four items), partially confirming Hypothesis 1. It should be noted that the factor loadings ranged from 0.48 to 0.95 ($M = 0.74$), in a demonstration that the factors explain most of the variance of the items. Furthermore, the internal consistency indexes of the scale factors, calculated by Cronbach's alpha, were 0.90 (affective), 0.82 (cognitive),

and 0.72 (behavioral). In addition, the internal consistency indices, calculated by the McDonald Omega were equal to 0.91 (affective), 0.83 (cognitive), and 0.75 (behavioral).

Considering the three-dimensional first-order structure model found, the Multigroup Factor Analysis (MGCFA) was used to evaluate the invariance of the item parameters among the participants regarding gender (male and female) and organizational sector (public and private). The results of the MGCFA are shown in Table 2.

Table 2
Multigroup confirmatory factor analysis (MGCFA)

Gender (Men X Women)	χ^2	($\Delta \chi^2$)	CFI	(Δ CFI)	RMSEA	(Δ RMSEA)
Configural	1082.4	-	0.972	-	0.085	-
Metric	1142.6	60.229	0.963	0.009	0.083	0.002
Scale	1163.8	21.183	0.957	0.006	0.079	0.004
Sector (Public X Private)	χ^2	($\Delta \chi^2$)	CFI	(Δ CFI)	RMSEA	(Δ RMSEA)
Configural	1204.6	-	0.949	-	0.085	-
Metric	1234.2	29.585	0.945	0.004	0.081	0.004
Scale	1253.6	19.415	0.943	0.002	0.076	0.005

Note. χ^2 = chi-square; $\Delta \chi^2$ = chi-square difference; CFI = Comparative Fix Index; Δ CFI = difference of CFI; RMSEA = Root Mean Square Error of Approximation; Δ RMSEA = difference of RMSEA; Configural = fixed factor structure across groups; Metric = fixed factor structure and factor loadings across groups; Scalar = fixed factor structure, factor loadings, thresholds and scalars across groups; n males = 168 n females = 296; n public sector = 144; n private sector = 320.

Regarding the invariance of the parameters between the investigated groups (gender and organizational sector), the impositions of restrictions brought small and practically negligible differences in the analyzed indicators. It is noteworthy that the chi-square differences between the more restricted and the less restricted models were not statistically significant (i.e. $\Delta \chi^2 / \Delta DF < 1.96$), as well as the CFI differences were less than 0.01. Such results indicate that, for the first-order three-factor model, the factor loadings, thresholds, and scalars were invariant

between male and female genders, and between the public and private sectors (Fischer & Karl, 2019), which makes it possible to confirm Hypothesis 2.

To verify the relationship between the instrument and external variables, a model composed of ten distinct and correlated factors (affective energy, cognitive energy, behavioral energy, autonomous motivation, controlled motivation, self-efficacy at work, autonomy at work, job satisfaction, job engagement, and organizational commitment) was tested in order to investigate the correlation

between POEM factors and other latent variables. The data obtained from the calculation of these correlations showed a positive correlation between the POEM factors and the

external variables, which confirms Hypothesis 3 (Table 3). The final model obtained from the POEM, with its respective standardized factorial loadings, is presented in Figure 1.

Table 3
Correlation between POEM and external variables

Variables	1	2	3	4	5	6	7	8	9
1. Affective energy	-								
2. Cognitive Energy	0.71**	-							
3. Behavioral Energy	0.67**	0.84**	-						
4. Autonomous Motivation	0.58**	0.59**	0.43**	-					
5. Controlled Motivation	0.60**	0.42**	0.47**	0.74**	-				
6. Self-efficacy at work	0.29**	0.29**	0.21**	0.54**	0.45**	-			
7. Autonomy at work	0.37**	0.43**	0.23**	0.52**	0.44**	0.44**	-		
8. Job Satisfaction	0.37**	0.28**	0.36**	0.28**	0.16**	0.13*	0.41**	-	
9. Work engagement	0.35**	0.25**	0.27**	0.30**	0.16**	0.18**	0.41**	0.94**	-
10. Organizational commitment	0.30**	0.26**	0.28**	0.15**	0.04	0.02	0.31**	0.87**	0.86**

Note. * $p < 0.01$; ** $p < 0.001$.

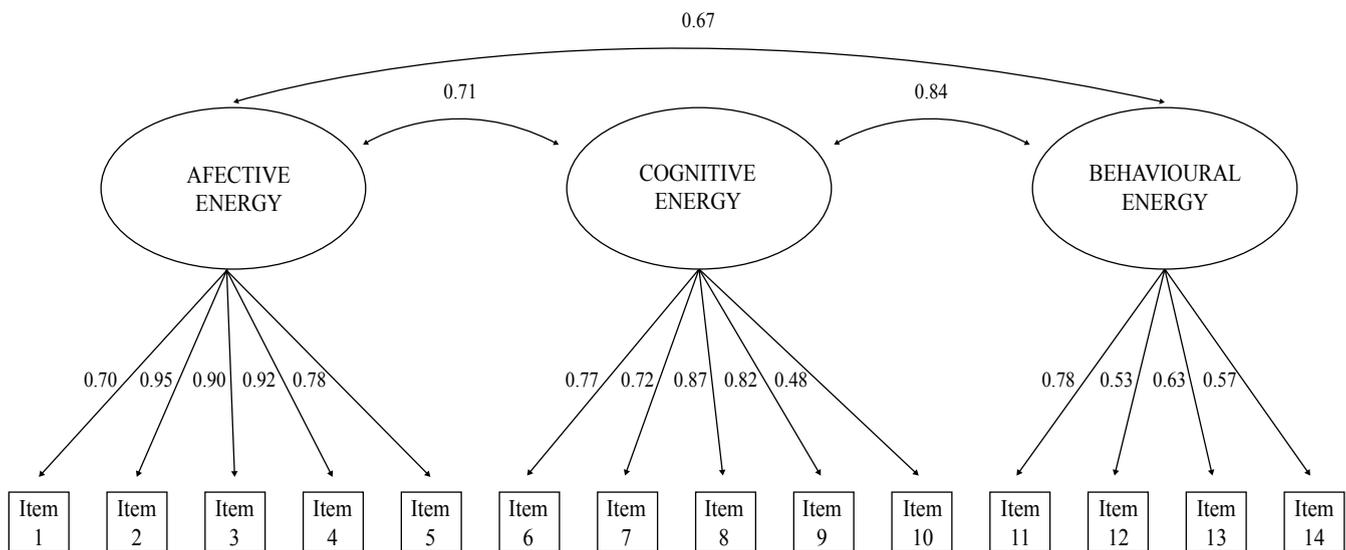


Figure 1. Final POEM model, with the standardized factor loadings

Discussion

This study aimed to investigate the evidence of internal structure validity and internal consistency of the Productive Organizational Energy Measure, as well as to assess the invariance of the instrument’s item parameters in terms of gender and organizational sector. In addition, it sought to verify the relationship of the instrument with external variables.

The data obtained in the confirmatory factor analysis revealed that the three-factor first-order model presented the best fit rates, partially confirming Hypothesis 1. These results

are divergent from the construction and validation study of the original instrument (Cole et al., 2012), in which an internal structure of three first-order factors and one second-order factor was obtained. However, the data found here are consistent with the results observed by Cuff and Barkhuizen (2014) in their validation study to the South African context. A possible explanation for the differences between the final model of the original study and the model currently obtained may be the fact that the two studies were conducted in different cultures. Considering that culture consists of a collective programming of the mind, which differentiates national

groups and guides their behavior, it is possible that different national patterns, stemming from the North American and Brazilian cultures, have interfered in the response profiles to the scale. Thus, the final Brazilian version of the POEM was composed of three distinct factors and 14 items. Thus, this research adds cross-cultural evidence to the conclusion that the model in which affective energy, cognitive energy, and behavioral energy are structured as distinct factors is the most adequate to describe the instrument.

The scale factors showed good internal consistency indices. These results are congruent with those obtained by Cole et al. (2012). These findings indicate that the scores of the three factors can be estimated with high accuracy, even with a reduced number of items, in samples of different nationalities. Thus, it was possible to verify that the instrument's scores are minimally accurate, i.e., with few measurement errors due to the lack of internal consistency.

Regarding the relationship of the instrument with external variables, it was possible to verify that the POEM factors showed positive and significant correlations with the two dimensions of work motivation, with self-efficacy at work and with autonomy at work. Such results are similar to those found by Cole et al. (2012) who found a positive correlation between such variables. Thus, it was observed that when employees feel motivated, they show more willingness to participate in organizational activities, feeling energized to meet the goals of the company in which they work (Damarasri & Ahman, 2020). Furthermore, in relation to work self-efficacy, it can act as a stimulus for the individual to perform their work tasks with energy, seeking to satisfy their and organizational goals (Parray, 2020). Finally, the relationship of job autonomy with productive organizational energy may have been occasioned because when workers can better use their potential in their work, they tend to feel more energized (Sorlie et al., 2022).

Similar to the study of Cole et al. (2012), the results obtained here demonstrated the positive relationship of productive organizational energy with job satisfaction, work engagement, and organizational commitment. Such findings align with the position of Dutton and Ragins (2007), for whom people energized in their jobs tend to engage more fully in their work activities and strengthen their bonds with organizations. Moreover, when employees enjoy positive interactions with each other, basic needs are being met, which enables an increase in the level of job satisfaction (Dutton & Ragins, 2007).

The results of the correlations obtained between productive organizational energy and the variables related to it signal, therefore, that productive organizational energy is an important variable of the organizational context, which benefits both employees and organizations. These results constitute evidence of the convergent validity of the scale, which, together with the results on the validity of its internal structure, reaffirm the possibilities of using the instrument to assess productive organizational energy.

This study also makes practical contributions. Given the empirical evidence presented, organizations can use

POEM to monitor productive organizational energy levels, aiming to ensure that energy is being adequately developed. This is how human resource professionals can diagnose where energy levels are most depleted within an organization. Such a diagnosis can shed light on necessary interventions, such as the insertion of rest periods.

The limitations of the study should also be pointed out. The first is that the study was based exclusively on self-report measures, which may lead to problems associated with the common variance of the method. These problems were minimized by the fact that anonymity was guaranteed to all participants and that there were no right or wrong questions, which would imply personal or professional risks to the respondents. Furthermore, data collection was conducted in two times and the items of the data collection instrument were on different variables, which also help to avoid biased responses (Jordan & Troth, 2020). Another limitation is that most of the sample was concentrated in a single region of Brazil, the Southeast, and 94% of the participants had complete or incomplete higher education. Therefore, it is not possible to generalize the results to other Brazilian regions or to samples of individuals with high school or college education.

With regard to a future research agenda, it is suggested that studies aimed at delving deeper into the nomological network of perceived organizational energy, particularly with regard to the impact of energy on individuals' work well-being and job performance, be conducted. These researches could be of longitudinal nature, in order to obtain greater understanding about the relationships between these variables. It is also suggested that comparative research be conducted with populations with other characteristics, such as adolescents and adults, who probably have different perceptions of productive organizational energy. Despite the limitations mentioned, the findings obtained here allow the conclusion that the Brazilian version of the Productive Organizational Energy Measure proved to be an appropriate instrument to evaluate the shared experience, in which members of an organization have positive affections, cognitive stimulation and proactive behavior in order to meet the objectives of the organization in which they work, in Brazilian samples.

References

- Barros, M. A., Oliveira, J. A., & Spyrides, M. H. C. (2012). Um estudo sobre autoeficácia no trabalho e características sociodemográficas de servidores de uma universidade federal [A study on self-efficacy at work and sociodemographic characteristics of civil servants of a federal university]. *REGE - Revista de Gestão*, 19(4), 571-588. doi:10.5700/rege479
- Breaugh, J. A. (1999). Further investigation of the work autonomy scales: Two studies. *Journal of Business and Psychology*, 13(3), 357-373. doi:10.1023/A:1022926416628

- Cole, M. S., Bruch, H., & Vogel, B. (2012). Energy at work: A measurement validation and linkage to unit effectiveness. *Journal of Organizational Behavior*, 33(4), 445-467. doi:10.1002/job.759
- Cuff, R., & Barkhuizen, E. N. (2014). Validating a measure of productive organisational energy in the South African context. *Mediterranean Journal of Social Sciences*, 5(4), 263-272. doi:10.5901/mjss.2014.v5n4p263
- Damarasri, B. N., & Ahman, E. (2020). Talent management and work motivation to improve performance of employees. *Dinasti International Journal of Education Management And Social Science*, 1(4), 490-498. doi: 10.31933/dijemss.v1i4.233
- Dutton, J. E., & Ragins, B. R. (Eds.). (2007). *Exploring positive relationships at work: Building a theoretical and research foundation*. Mahwah, NJ: Lawrence Erlbaum
- Ferreira, M. C., Valentini, F., Damásio, B. F., Mourão, L., Porto, J., Chinelato, R. S. C., ... Pereira, M. M. (2016). Evidências adicionais de validade da UWES-9 em amostras brasileiras [Additional validity evidences of UWES-9 in Brazilian samples]. *Estudos de Psicologia (Natal)*, 21(4), 435-445. doi:10.5935/1678-4669.20160042
- Fischer, R., & Karl, J. A. (2019). A primer to (Cross-Cultural) multi-group invariance testing possibilities in R. *Frontiers in Psychology*, 10, 1507. doi:10.3389/fpsyg.2019.01507
- Gabardo-Martins, L., Ferreira, M. C., & Valentini, F. (2021). Testing the Two Directions of the Work-Family Interface: A Diary Study. *The Spanish journal of psychology*, 24, e38. <https://doi.org/10.1017/SJP.2021.36>
- Gagne, M., Forest, J., Gilbert, M. H., Aube, C., Morin, E., & Malorni, A. (2010). The Motivation at Work Scale: Validation Evidence in Two Languages. *Educational and Psychological Measurement*, 70(4), 628-646. doi:10.1177/0013164409355698
- Gregoire, J. (2018). ITC guidelines for translating and adapting tests. *International Journal of Testing*, 18(2), 101-134. doi:10.1080/15305058.2017.1398166
- Jordan, P. J., & Troth, A. C. (2020). Common method bias in applied settings: The dilemma of researching in organizations. *Australian Journal of Management*, 45(1), 3-14. doi:10.1177/0312896219871976
- Louw, K., Sutherland, M., & Hofmeyr, K. (2012). Enabling and inhibiting factors of productive organisational energy. *South African Journal of Labour Relations*, 36(2), 9-29. Retrieved from https://repository.up.ac.za/bitstream/handle/2263/19972/Louw_Enabling%282012%29.pdf?sequence=1&isAllowed=y
- Luthans, F., & Youssef-Morgan, C. M. (2021). Positive workplaces. In C. R. Snyder, S. J. Lopez, L. M. Edwards, & S. C. Marques (Eds.), *The Oxford handbook of positive psychology* (3rd ed., pp. 820-831). New York, NY: Oxford University Press.
- Medeiros, C., & Enders, W. T. (1998). Validação do modelo de conceitualização de três componentes do comprometimento organizacional (Meyer e Allen, 1991). *Revista de Administração Contemporânea* [online], 2(3), 67-87. doi:10.1590/S1415-65551998000300005
- Parray, Z. A. (2020). Impact of organisational, personal and interpersonal factors on employee performance in Small and Medium Size Enterprises. *Small Enterprises Development, Management & Extension Journal*, 47(3), 229-249. doi:10.1177/09708464211038693
- Quinn, R. W. (2007). Energizing others in work connections. In J. E. Dutton & B. R. Ragins (Eds.), *Exploring positive relationships at work: Building a theoretical and research foundation* (pp. 73-90). Mahwah, NJ: Lawrence Erlbaum.
- R Core Team. (2017). *R: A language and environment for statistical computing*. Vienna, Austria: R Foundation for Statistical Computing. Retrieved from <https://www.R-project.org/>
- Seligman, M. E. P., & Csikszentmihalyi, M. (2000). Positive psychology: An introduction. *American Psychologist*, 55(1), 5-14. doi:10.1037/0003-066X.55.1.5
- Schaufeli, W. (2021). Engaging leadership: How to promote work engagement? *Frontiers in Psychology*, 12, 754556. doi:10.3389/fpsyg.2021.754556
- Sorlie, H. O., Bakker, A. B., Espevik, R., & Olsen, O. K. (2022). Daily autonomy and job performance: Does person-organization fit act as a key resource? *Journal of Vocational Behavior*, 133, 103691. doi:10.1016/j.jvb.2022.103691
- Xia, Y., & Yang, Y. (2019). RMSEA, CFI, and TLI in structural equation modeling with ordered categorical data: The story they tell depends on the estimation methods. *Behavior Research Methods*, 51, 409-428. doi:10.3758/s13428-018-1055-2

Larissa Maria David Gabardo-Martins is a Professor of the Universidade Salgado de Oliveira, Niterói-RJ, Brazil.

Authors' Contribution:

The author is responsible for the conception and design of this study, analysis and interpretation of data, review of the manuscript and approval of the final version. The author assumes public responsibility for the content of the manuscript.

Associate editor:

Wanderlei Abadio de Oliveira

Received: Sep. 15, 2021

1st Revision: May. 15, 2022

Approved: May. 23, 2022

How to cite this article:

Gabardo-Martins, L. M. D. (2022). Evidence of validity of the productive organizational energy measure in brazilian samples. *Paidéia (Ribeirão Preto)*, 32, e3222. doi:<https://doi.org/10.1590/1982-4327e3222>